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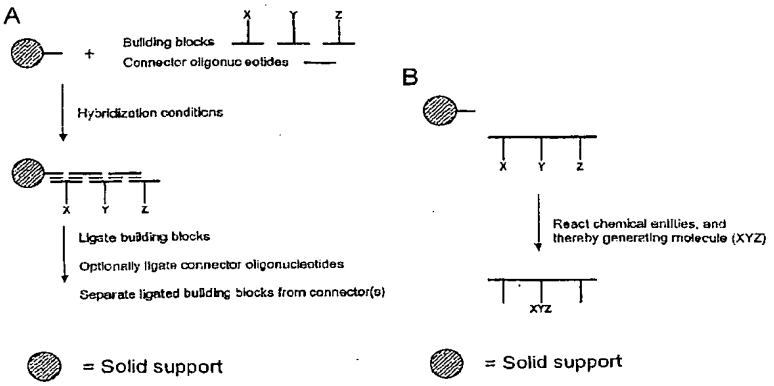
[Continued on next page]

(54) Title: LIGATIONAL ENCODING USING BUILDING BLOCK OLIGONUCLEOTIDES



(57) Abstract: The present invention in one aspect relates to a method for synthesizing a bifunctional complex comprising a molecule and an identifier polynucleotide identifying at least some of the chemical entities which have participated in the synthesis of the molecule in accordance with the methods of the present invention. The invention also relates to a library of different bifunctional complexes. The library of the invention can be used e.g. for identifying drug leads. Furthermore, the present invention is based on the principle that chemical entities initially provided on a building block oligonucleotide (i.e. a building block having an oligonucleotide part which is linked to a chemical entity) can be brought into reactive proximity without the use of a template comprising a set of covalently linked codons. Also, the present invention allows reaction of chemical entities when the chemical entities are linked to a single stranded identifier polynucleotide obtained by covalently linking the oligonucleotide parts (oligonucleotide identifiers) of the building blocks. The single stranded identifier polynucleotides differs from template directed synthesis methods employing codon and anti-codon hybridisation between a template and one or more transfer units, i.e. methods wherein e.g. reactive units on transfer units are reacted while the anti-codon of the transfer units are hybridised to template codons.

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